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Contents

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Heat-related Injuries, U.S. Army, 2005

Throughout history, heat-related injuries have been significant threats to the health and operational effectiveness of military members.[1] Decades of operational lessons learned and numerous research studies have resulted in doctrine, equipment, and training methods that significantly reduce the adverse effects of heat on U.S. military activities.[2] Still, physical exertion in hot environments causes numerous (and occasionally fatal) injuries of U.S. soldiers.

On a regular basis, the *MSMR* summarizes the heat injury experience of U.S. Army soldiers. This report summarizes hospitalizations, outpatient visits, and notifiable medical event reports related to heat injuries among active duty soldiers from January through December 2005.

Methods: The DMSS was searched to identify all medical encounters and notifiable medical event reports that included a diagnosis of "other and unspecified effects of heat and light" (ICD-9-CM: 992.0-992.9). If more than one source documented a heat injury episode, information for summary purposes was derived from the hospitalization record (if one was available) or the reportable event record; ambulatory records were used when they were the

Table 1. Incident cases and rates of heat stroke and heat exhaustion, active soldiers, U.S. Army, 2005

	Heat stroke (ICD-9-CM: 992.0)		Heat exhaustion (ICD-9-CM: 992.3 - 5)	
	Cases	Incidence rate (per 1000 p-yrs)	Cases	Incidence rate (per 1000 p-yrs)
Total	204	0.45	958	2.11
Sex				
Male	187	0.48	767	1.98
Female	17	0.26	191	2.89
Age group				
<20	29	0.96	155	5.11
20-24	91	0.57	434	2.74
25-29	40	0.39	190	1.85
30-34	25	0.36	110	1.58
35-39	12	0.23	44	0.84
>=40	7	0.17	25	0.62
Race				
White	139	0.51	669	2.44
Black	47	0.47	203	2.04
Other/unknown	18	0.23	86	1.08
Military status				
Enlisted	175	0.45	897	2.33
Officer (incl. warrant)	29	0.42	61	0.89
Mil occupation				
Combat	98	0.80	323	2.63
Healthcare	9	0.20	84	1.88
Other	97	0.34	551	1.92

only sources of information regarding particular episodes. Finally, to reduce the misclassification of clinical follow-ups as incident cases, medical encounters that occurred within seven days of a prior heat injury diagnosis were excluded.

Results: In 2005, there were 204 incident cases of heat stroke and 958 incident cases of heat exhaustion among active soldiers. Crude incidence rates of heat stroke and heat exhaustion were 0.45 and 2.11 per 1,000 person-years (p-yrs), respectively (Table 1).

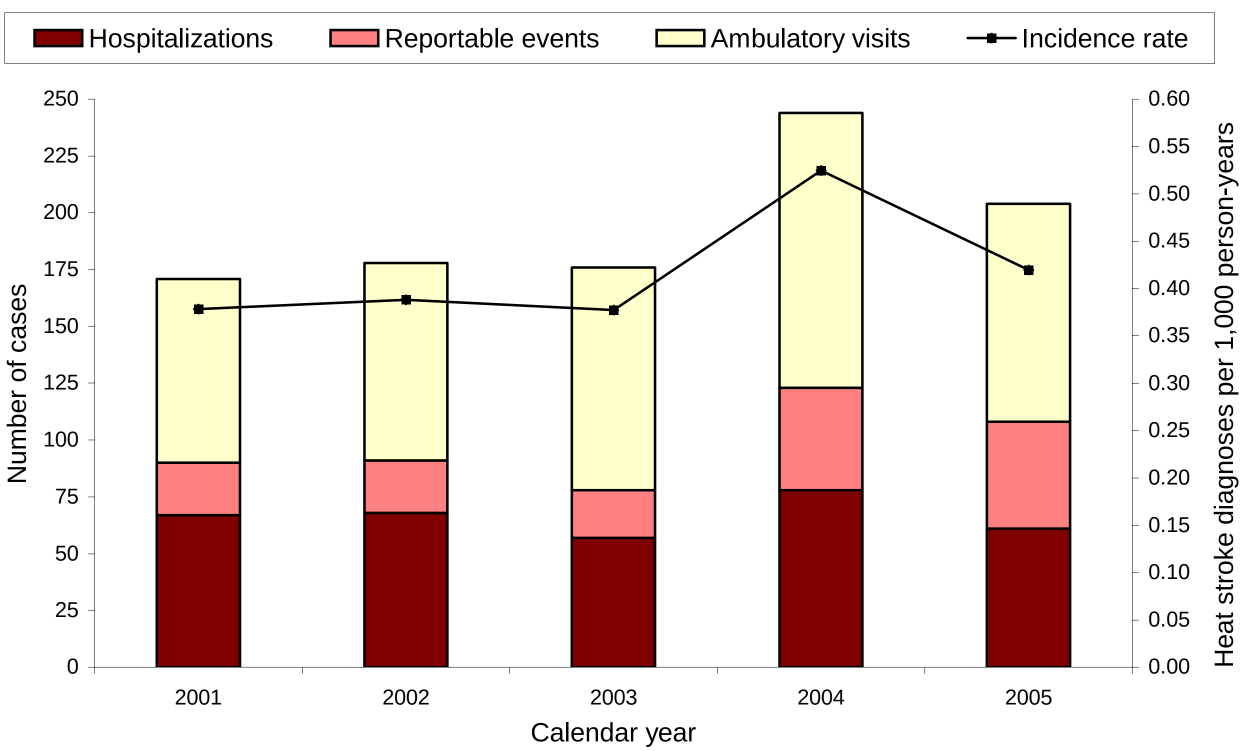
Rates of heat stroke and heat exhaustion declined with increasing age and were higher in combat-related compared to other occupational groups (Table 1). Of interest, the heat stroke rate was nearly twice as high among males than females, while the heat exhaustion rate was higher among females than males (Table 1).

The rate (unadjusted) of heat stroke in 2005 was slightly lower than in 2004 but slightly higher than the annual rates from 2001 to 2003 (Figure 1). The rate (unadjusted) of heat exhaustion in 2005 was 27% higher than in 2004 and 80% higher than in 2003 (Figure 2). While the heat exhaustion rate in 2005 was the highest of the 5-year surveillance period, there were fewer hospitalized cases of heat exhaustion in 2005 than in any other year of the period (Figure 2).

***Editorial comment*:** In the past 5 years, there has been no clear trend in heat stroke incidence among soldiers. In contrast, in the past 3 years, there has been a sharp increase in reports of heat exhaustion among soldiers. Of note, the increase in heat exhaustion cases overall did not include an increase in hospitalized cases. In fact, in 2005, there were fewer hospitalizations for heat exhaustion than in any of the preceding 4 years.

The findings regarding heat exhaustion suggest that heat injuries may be evacuated from field settings to fixed medical facilities more often and/or earlier in their clinical courses; that ascertainment and reporting of heat exhaustion cases may be improving; and/or that the incidence of heat exhaustion – not serious enough to require hospitalization – is increasing.

Figure 1. Number and rate of heat stroke diagnoses, by source of report and year of diagnosis, active duty, U.S. Army, 2001-2005.



Whatever the reasons for the recent increase in heat exhaustion reports, it remains clear that military activities in hot and humid environments are significant threats to the health and operational effectiveness of soldiers. Among all soldiers, the youngest and most inexperienced remain at highest risk. Small unit leaders, training cadre, and supporting medical personnel, particularly at initial entry training centers, must ensure that soldiers whom they supervise and support are informed regarding risks, preventive countermeasures (e.g., water consumption), early signs and symptoms, and first responder actions related to heat injuries.[2]

The Army's heat injury prevention program and other information related to heat injury prevention and treatment are accessible at the following website: < http://chppm-www.apgea.army.mil/heat/#PM >.

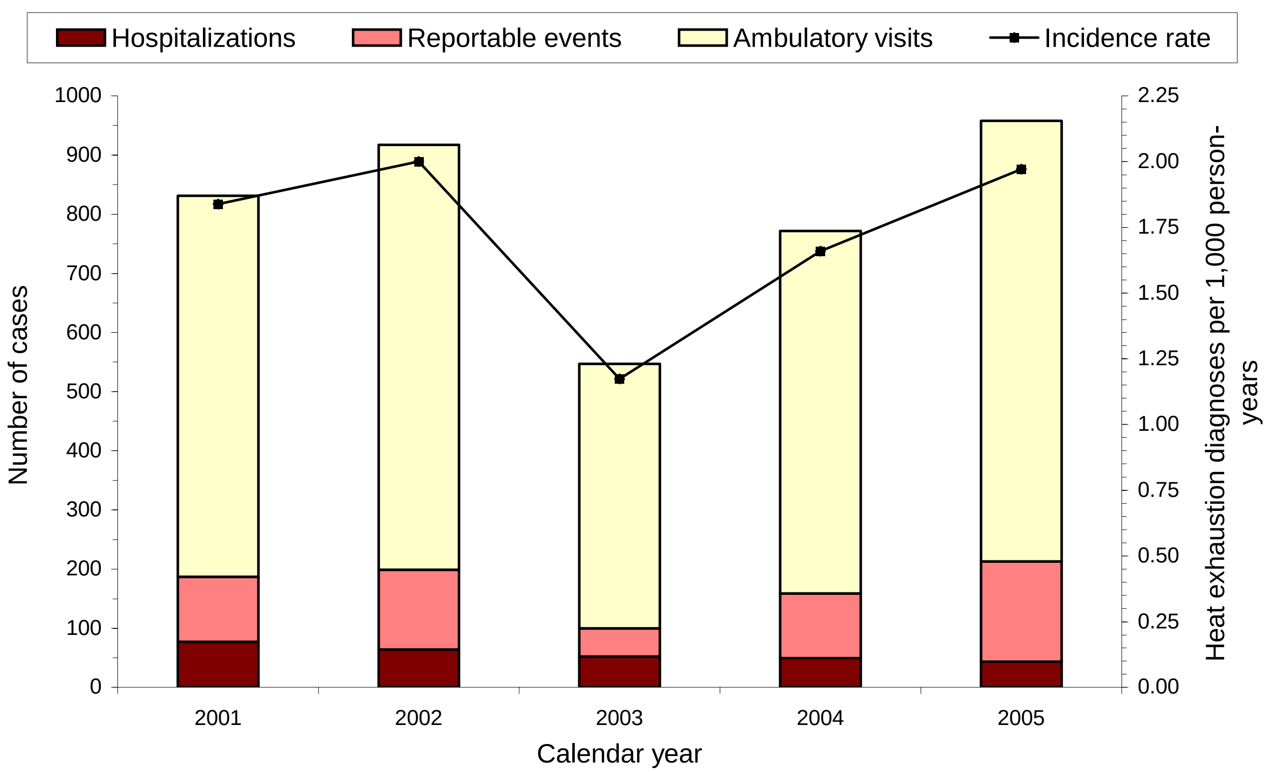
Analysis by Dwana Green, MPH, Analysis Group, Army Medical Surveillance Activity.

References

1. Goldman RF. Ch 1: Introduction to heat-related problems in military operations, in *Textbook of Military Medicine: Medical Aspects of Harsh Environments* (vol 1). Borden Institute, Office of the Surgeon General, U.S. Army. Washington, DC. 2001. Accessed on 22 August 2006 at: < www.bordeninstitute.army.mil/medaspofharshenvrnmnts/default_index.htm >.

2. Technical Bulletin Medical 507/AFPAM 48-152(l). Heat stress control and heat casualty management, prevention, training and control of heat injury. Headquarters, Department of the Army and Air Force. Washington, DC. 7 March 2003.

Figure 2. Number and rate of heat exhaustion diagnoses, by source of report and year of diagnosis, active duty, U.S. Army, 2001-2005.



Hyponatremia/overhydration, Active Duty, U.S. Army, January 1999-July 2006

In September 1997, the *MSMR* reported the results of an epidemiological investigation of a cluster of life threatening cases of hyponatremia (low sodium level in the blood) associated with excessive water consumption during training in heat stressful conditions.[1,2] In April 1998, the Army revised its fluid replacement guidelines to establish an upper limit of fluid intake during military training in heat.[3] In March 2000, the *MSMR* reported that in the two years following implementation of the revised guidelines, case incidence of hyponatremia/overhydration among soldiers had declined at Fort Benning (the infantry training center of the Army) but remained relatively stable in the rest of the Army.[4] The present summary continues the *MSMR*'s surveillance of hyponatremia/ overhydration to assess the long-term impact of the 1998 policy revision.

Methods: The surveillance period was 1 January 1999 through 31 July 2006. The surveillance population included all individuals who served on active duty in the U.S. Army any time during the surveillance period. All data were obtained from the Defense Medical Surveillance System (DMSS). For surveillance purposes, a case of "hyponatremia/overhydration" was defined as a hospitalization or outpatient visit of an active duty soldier in which (a) the primary (first listed) diagnosis was "hyposmolality and/or hyponatremia" (ICD-9-CM code 276.1); or (b) diagnoses (in any positions) included hyponatremia plus "fluid overload" (ICD-9-CM code 276.6) and/or "effects of heat" (ICD-9-CM codes 992.0-992.9). Twenty cases were excluded because of underlying other conditions (e.g., syndrome of inappropriate antidiuretic hormone secretion [SIADH], psychosis, kidney disease). For each individual, only the first hospitalization or outpatient visit that met the surveillance case definition was maintained.

Results: From January 1999 to July 2006, 248 cases of hyponatremia/overhydration were reported among active duty soldiers (Table 1). The mean number of cases per year was 33. There were no clear trends in case incidence during the period (Figure 1). The most cases per year were in 2001 (n=45) and 2004 (n=42) and the fewest in 2002 (n=25) and 2000 (n=27) (Table 1).

Approximately one-fourth (n=61, 24.6%) of all cases were hospitalized for treatment. No fatalities were reported among hospitalized cases. Three individuals had episodes of hyponatremia/ overhydration in two different years.

The location with the most cases (n=38) during the period was Fort Benning (Table 1). Soldiers stationed in Europe and at eight installations in the continental United States (including the 3 largest: Fort Bragg, NC, Fort Hood, TX, and Fort Campbell, KY) accounted for the majority (58.5%)

Table 1. Hyponatremia/overhydration by installation, active duty, U.S. Army, January 1999-June 2006

	1999		2000		2001		2002		2003		2004		2005		2006		Total	
Location	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Ft. Benning	1	3.3	5	18.5	12	26.7	3	12.0	2	6.7	6	14.3	4	16.0	1	4.2	34	13.7
Ft. Bragg	0	0.0	3	11.1	4	8.9	4	16.0	4	13.3	3	7.1	1	4.0	2	8.3	21	8.5
Ft. Jackson	4	13.3	2	7.4	2	4.4	0	0.0	1	3.3	3	7.1	1	4.0	1	4.2	14	5.6
Ft. Bliss	3	10.0	0	0.0	1	2.2	0	0.0	3	10.0	5	11.9	0	0.0	1	4.2	13	5.2
Ft. L. Wood	0	0.0	2	7.4	3	6.7	3	12.0	0	0.0	1	2.4	3	12.0	0	0.0	12	4.8
Ft. Campbell	2	11.1	0	0.0	1	2.2	1	4.0	2	6.7	3	7.1	1	4.0	1	4.2	11	4.4
Ft. Hood	1	3.3	2	7.4	2	4.4	1	4.0	1	3.3	1	2.4	2	8.0	1	4.2	11	4.4
Ft. Gordon	3	10.0	0	0.0	2	4.4	0	0.0	1	3.3	2	4.8	1	4.0	0	0.0	9	3.6
Ft. Sill	2	6.7	1	3.7	1	2.2	0	0.0	0	0.0	2	4.8	2	8.0	0	0.0	8	3.2
Europe	2	6.7	0	0.0	0	0.0	1	4.0	3	10.0	2	4.8	2	8.0	2	8.3	12	4.8
Other	12	0.4	12	44.4	17	37.8	12	48.0	13	43.3	14	33.3	8	32.0	15	62.5	103	41.5
Total	**30**		**27**		**45**		**25**		**30**		**42**		**25**		**24**		**248**	

of all cases (Table 1). Three basic training installations – Fort Benning, GA, Fort Jackson, SC, and Fort Leonard Wood, MO – were among the top five installations in relation to total cases during the period (Table 1).

Editorial comment: Hyponatremia/hyposmolality due to excessive water consumption is a life threatening condition that is preventable. Since 1999 in the U.S. Army, there has not been a clear trend in overall case incidence. During the 7.5 year period examined for this report, there were approximately 33 cases per year of hyponatremia (with no apparent predisposing conditions). This is higher than the average number of cases (22 per year) reported in the *MSMR* during the period 1997 through 1999. An increase in reported cases since the revision of the fluid replacement guidelines may reflect greater awareness among Army medical practitioners (in turn, more complete reporting) of hyponatremia/overhydration among soldiers with heat-related injuries.[5]

The findings of this surveillance should be interpreted cautiously. For example, cases that occur during field training exercises and overseas deployments (unless treated in fixed military medical facilities) are not systematically reported and thus are not included. Also, many practitioners may be unaware of the risks associated with excessive water consumption in heat stressful conditions and/or the ICD-9-CM code specific for "hyposmolality and/or hyponatremia" (ICD-9-CM: 276.1) such practitioners would likely report cases simply as "heat injuries" (ICD-9-CM: 992).

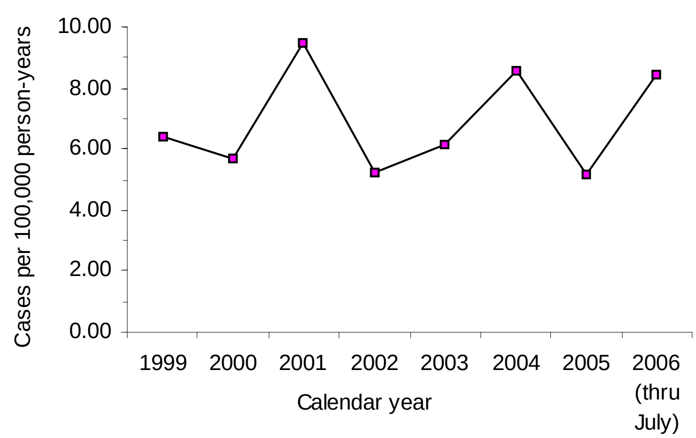
To increase the specificity of our surveillance case definition, we required diagnoses of "fluid overload" and/or "effects of heat" in addition to "hyponatremia" (if "hyponatremia" was not the primary diagnosis). Our surveillance would have missed a fatal case of hyponatremia due to excessive water consumption in an Army trainee in July 1997 because "hyponatremia" was not the primary diagnosis and "fluid overload" and "effects of heat" were not reported. Finally, we did not thoroughly review the medical histories or clinical courses of all soldiers included as cases; thus, some of our cases may have had predisposing conditions and/or causes of "hyposmolality and/or hyponatremia" other than excessive water consumption. The inclusion of laboratory data, e.g., serum sodium concentrations, in the Defense Medical Surveillance System would enhance the reliability of surveillance of such conditions as "hyponatremia/overhydration."

The most significant heat-related threats to service members by far are those associated with too little, rather than too much, water consumption. U.S. Army fluid replacement policies are designed to prevent both dehydration and water intoxication risks. To minimize casualties and training disruptions in hot weather, the military services should assure that training personnel at all levels are aware of current fluid replacement guidelines and understand that non-compliance can have immediate, life threatening consequences. In addition, service members should be aware of risks associated with strenuous work and exercise in hot weather – and appropriate rest and rehydration procedures – during and off duty.

Analysis by Dwana Green, MPH, Analysis Group, Army Medical Surveillance Activity.

References
1. USACHPPM. Hyponatremia secondary to heat stress and excessive water consumption: Fort Benning, Georgia; Fort Leonard Wood, Missouri; Fort Jackson, South Carolina, June-August 1997. *MSMR* 1997;3(6):2.
2. USACHPPM. Hyponatremia secondary to heat stress and excessive water consumption: outbreak investigation and recommendations. *MSMR* 1997 Sep;3(6):9.
3. Memorandum, subject: Policy guidance for fluid replacement during training, Department of the Army, Office of the Surgeon General, dated 29 April 1998.
4. Craig SC. Hyponatremia associated with heat stress and excessive water consumption:
the impact of education and a new Army fluid replacement policy. *MSMR* 1999 Mar;5(2):2-9.
5. O'Brien KK, Montain SJ, Corr WP, et al. Hyponatremia associated with overhydration in U.S. Army trainees. *Mil Med* 2001 May;166(5):405-10.

Figure 1. Incidence rates of hyponatremia/ overhydration, active duty, U.S. Army, 1999-2006.



Hepatitis B Immunity among U.S. Army Basic Trainees, Fort Leonard Wood, Mo, July 2005-December 2005

The hepatitis B virus causes acute and chronic diseases of the liver. It has a worldwide distribution and is transmitted in blood and through sexual contact. In the United States, rates of new infections with and acute disease from hepatitis B are highest among young adults. However, chronic infections are most likely among those infected as infants or young children; and chronic hepatitis B can have life threatening consequences including cirrhosis, liver cancer, and liver failure.

Vaccines against hepatitis B have been available in the United States since 1982. In October 1997, as part of a national strategy to prevent hepatitis B transmission, the Advisory Committee on Immunization Practices (ACIP) of the Centers for Disease Control and Prevention recommended that all unvaccinated children aged 0-18 years receive hepatitis B immunizations.[1]

In 2002, the Department of Defense mandated hepatitis B immunization of all military accessions. Since then, new enlisted accessions to the Army have been required to demonstrate proof of hepatitis B immunity, either through active immunization or serologic confirmation of immunity.[2] Although the U.S. Air Force has implemented universal serologic screening since 2002 at its single enlisted recruit processing station, the U.S. Army has failed to implement similar large-scale serosurveillance testing, in part because the U.S. Army performs decentralized processing of new enlisted accessions at five basic combat training sites (Fort Sill, OK; Fort Knox, KY; Fort Jackson, SC; Fort Benning, GA, and Fort Leonard Wood, MO).

Typically, new Army trainees received the three dose series of adult monovalent hepatitis B vaccine, alone or in combination with hepatitis A immunization as a three-dose series of bivalent hepatitis A/B vaccine (Twinrix®). The U.S. Army Accession Screening and Immunization Program (ASIP)[3] was developed by staff of the Army Medical Surveillance Activity (AMSA) to implement the April 2004 recommendations of the Armed Forces Epidemiological Board to use serologic screening, where feasible, to reduce unnecessary immunizations among U.S. Army basic trainees.[4] Such programs are cost-saving, particularly due to rising levels of immunity to hepatitis B.[5,6] The ASIP centrally redirects local cost-savings from averted unnecessary immunizations to fund the serosurveillance infrastructure, staff, and technical systems needed for successfully implementing universal serologic screening.[7]

To test the feasibility and potential cost-savings of the ASIP, staff at the Fort Leonard Wood Reception Battalion implemented a pilot hepatitis B screening program beginning in the summer of 2005.[8] This report documents serologic evidence of immunity to hepatitis B among new trainees who processed through the reception station at Fort Leonard Wood between July and December 2005.

Methods: For this analysis, qualitative results of hepatitis B surface antibody testing performed at the Fort Leonard Wood Reception Battalion were merged with demographic data maintained in the Defense Medical Surveillance System (DMSS). Prevalences of antibodies to hepatitis B were evaluated overall and in relation to age and gender. In accordance with the processing rules implemented through the ASIP, initially indeterminate test results were treated as negative test results and not repeated.

Results: From 1 July 2005 through 31 December 2005, hepatitis B surface antibody test results were obtained from 12,285 basic trainees of the active and reserve components of the U.S. Army. Of the 12,268 trainees with accessible demographic information,

Table 1. Demographic characteristics of basic combat trainees, Fort Leonard Wood, MO, July 2005-December 2005

Age group	Male	Female	Total
17-19	5,702	2,018	7,720
20-24	2,422	848	3,270
25-29	592	206	798
30-34	249	76	325
35+	116	39	155
Total	9,081	3,187	12,268

approximately three-fourths (74.0%) were male, nearly two-thirds were teen-agers (62.9%), and only approximately one of 10 (10.4%) were 25 or older (Table 1).

More than half of all trainees (53.1%) had serologic evidence of immunity to hepatitis B (Figure 1). Prevalences of antibodies to hepatitis B were similar among males (52.8%) and females (54.1%) but sharply declined with increasing age (17-19 years: 62.1% ; 20-24 years: 44.6%; 25 years and older: 20.8%) (Figure 1).

Editorial comment: This report documents much higher prevalences of immunity to hepatitis B among teen-aged compared to older enlisted accessions to the U.S. Army in 2005. The finding reflects increasing compliance with national recommendations that all school-aged children (through 18 years old) be immunized against hepatitis B. Over time, the routine screening of new accessions to identify those already immune to hepatitis B (and other vaccine-related diseases) will prevent increasing numbers of unnecessary vaccinations and avoid the associated costs.

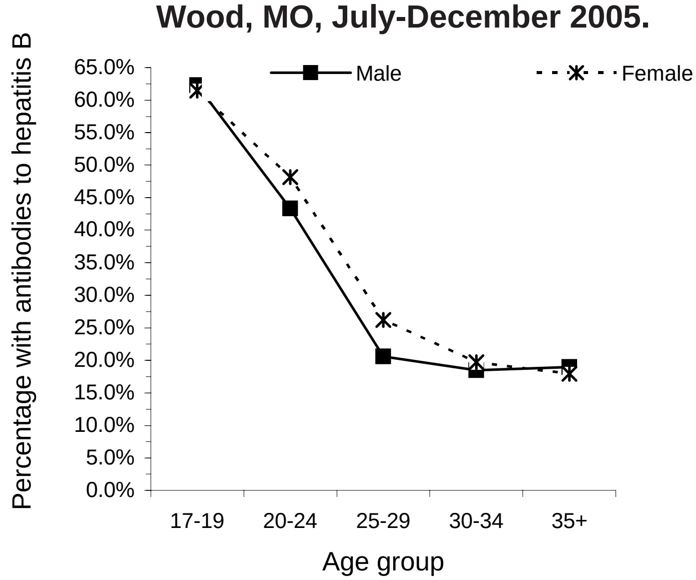
Currently, AMSA performs routine surveillance only for HIV-1 infections. With the ASIP, population-based testing of U.S. Army soldiers for vaccine preventable diseases has been institutionalized. The ASIP includes universal testing of new enlisted accessions for pre-existing immunity to hepatitis A, hepatitis B, measles, rubella and varicella. Eventually, blood typing and glucose-6-phosphate dehydrogenase (G6PD) screening of all accessions may be included. Thus, this report elucidates an emerging role for routine serosurveillance (i.e., routine surveillance of results of population-based serologic testing) in the U.S. Military Health System.

Finally, this analysis was conducted by a one-time merging of laboratory test results with demographic data contained within DMSS for the purpose of program evaluation. Automatic integration of selected laboratory test results into the DMSS could significantly enhance military medical surveillance capabilities.

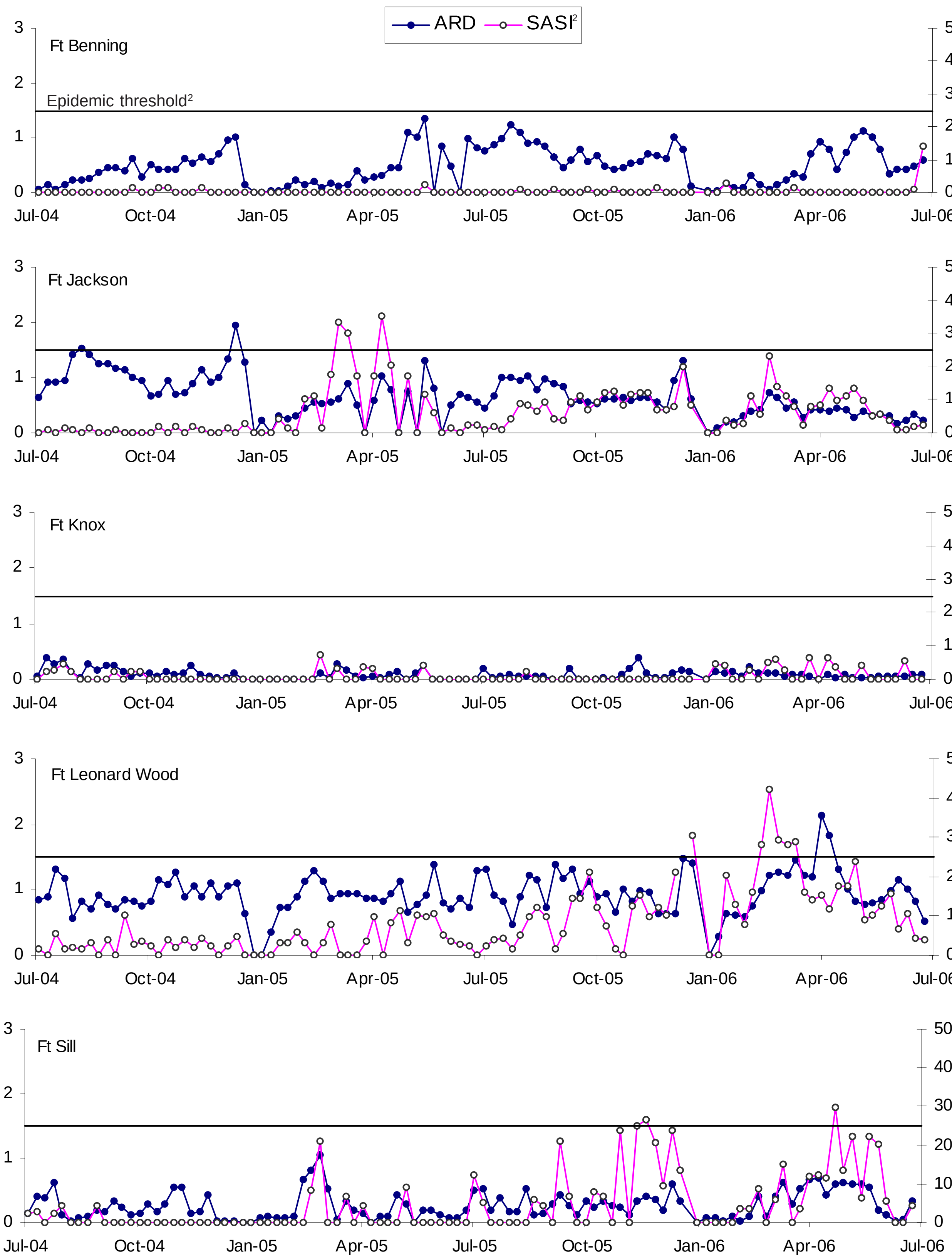
References

1. Centers for Disease Control and Prevention. Recommendations and reports: A comprehensive immunization strategy to eliminate transmission of hepatitis B virus infection in the United States. Recommendations of the Advisory Committee on Immunization Practices (ACIP) Part 1: Immunization of infants, children, and adolescents. 2005 December 23;54(RR16):1-23.
2. Department of the Army, Headquarters, U.S. Army Medical Command. Memorandum for Commanders, MEDCOM major subordinate commands, dated 7 August 2002, subject: Vaccination of new recruits against hepatitis B virus. Accessed on 29 August 2006 at: < http://www.vaccines.mil/documents/371HBVaccination.pdf >
3. Nevin RL. The US Army Accession Screening and Immunization Program (ASIP) Business Plan. USACHPPM Technical Guide 310. 18 November 2005.
4. Armed Forces Epidemiological Board. Memorandum for Assistant Secretary of Defense (Health Affairs) and Surgeons General of the Army, Navy, and Air Force, dated 16 April 2004, subject: Multiple concurrent immunizations and safety concerns 2004-04. Accessed on 29 August 2006 at: < www.ha.osd.mil/afeb/2004/2004-04.pdf >
5. Arya SC. Cost saving potential of pre-vaccination antibody testing for hepatitis B vaccination in military personnel [letter]. Mil Med. 2001 Jan; 166(7):ii.
6. Scott PT, Niebuhr DW, McGready JB, Gaydos JC. Hepatitis B immunity in United States military recruits. J Infect Dis. 2005 Jun 1;191(11):1835-41.
7. Department of the Army, Headquarters, U.S. Army Medical Command. Memorandum thru Commanders, MEDCOM regional medical commands to Commanders, U.S. Army MEDDACS, Forts Benning, Jackson, Knox, Leonard, and Sill, dated 18 November 2005, subject: Standards for immunization delivery at basic combat training (BCT) posts. Accessed on 29 August 2006 at: < www.vaccines.mil/documents/950Memo18NOV05Standards.pdf >
8. Pablo K, Rooks P, Nevin R. Benefits of serologic screening for hepatitis B immunity in military recruits [letter]. J Infect Dis. 2005 Jun 1;191(11):1835-41.

Figure 1. Prevalance of (%) of immunity to hepatitis B among U.S. Army basic combat trainees, by age group and gender, Fort Leonard Wood, MO, July-December 2005.



Acute respiratory disease (ARD) and streptococcal pharyngitis (SASI), Army basic training centers, by week through July 31, 2006



¹ ARD rate = cases per 100 trainees per week

² SASI (Strep ARD surveillance index) = (ARD rate)x(rate of Group A beta-hemolytic strep)

³ ARD rate >=1.5 or SASI>=25.0 for 2 consecutive weeks indicates an "epidemic"

Update: Pre- and Post-deployment Health Assessments, U.S. Armed Forces, January 2003-June 2006

The June 2003 issue of the *MSMR* summarized the background, rationale, policies, and guidelines related to pre-deployment and post-deployment health assessments of servicemembers.[1-10] Briefly, prior to deploying, the health of each servicemember is assessed to ensure his/her medical fitness and readiness for deployment. At the time of redeployment, the health of each servicemember is again assessed to identify medical conditions and/or exposures of concern to ensure timely and comprehensive evaluation and treatment.

Completed pre- and post-deployment health assessment forms are routinely sent (in hard copy or electronic form) to the Army Medical Surveillance Activity (AMSA) where they are archived in the Defense Medical Surveillance System (DMSS).[11] In the DMSS, data recorded on pre- and post-deployment health assessments are integrated with data that document demographic characteristics, military experiences, and medical encounters of all servicemembers (e.g., hospitalizations, ambulatory visits, immunizations).[11] The continuously expanding DMSS database can be used to monitor the health of servicemembers who participated in major overseas deployments.[11-14]

The overall success of deployment force health protection efforts depends at least in part on the completeness and quality of pre- and post-deployment health assessments. This report summarizes characteristics of servicemembers who completed pre-and post-deployment forms since 1 January 2003, responses to selected questions on pre- and post-deployment forms, and changes in responses of individuals from pre-deployment to post-deployment.

Methods: For this update, the DMSS was searched to identify all pre- and post-deployment health assessments (DD Form 2795 and DD Form 2796, respectively) that were completed after 1 January 2003.

Results: From 1 January 2003 to 30 June 2006, 1,339,803 pre-deployment health assessments and 1,342,642 post-deployment health assessments were completed at field sites, shipped to AMSA, and integrated in the DMSS database (Table 1).

In general, the distributions of self-assessments of "overall health" were similar among pre- and post-deployment form respondents (Figure 1). For example, both prior to and after deployment, the most frequent descriptor of "overall health" was "very good." Of note, relatively more pre- (33%) than post- (23%) deployment respondents assessed their overall health as "excellent"; while more post- (41%) than pre- (25%) deployment respondents assessed their overall health as "good," "fair," or "poor" (Figure 1).

Among servicemembers (n=680,517) who completed both a pre- and a post-deployment health assessment, fewer than half (45%) chose the same descriptor of their overall health before and after deploying (Figures 2,3). Of those (n=376,391) who changed their assessments from pre- to post-deployment, three-fourths (75%) changed by a single category (on a five category scale) (Figure 3); and of those who changed by more than one category, nearly 5-times as many indicated a decrement in overall health (n=76,778; 11.3% of all respondents) as an improvement (n=16,546; 2.4% of all respondents) (Figure 3).

On post-deployment forms, 22% of active and 40% of Reserve component respondents reported "medical/dental problems" during deployment (Table 2). Among active component respondents, "medical/dental problems" were more frequently reported by soldiers (30%) and Marines (20%) than by members of the other Services (12%). Among Reservists, members of the Air Force reported "medical/dental problems" much less often than members of the other Services (Table 2).

Approximately 4% and 6% of active and Reserve component respondents, respectively, reported "mental health concerns." "Mental health concerns" were reported relatively more frequently by soldiers (active: 7%; Reserve: 7%) than members of the other Services (Table 2). Post-deployment forms from approximately one-fifth (18%) of active component and one-fourth (24%) of Reserve component members documented that "referrals"

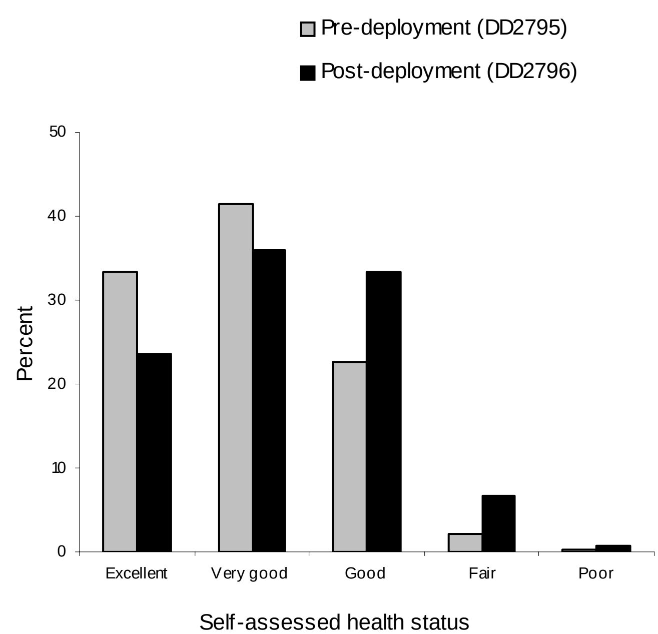
Table 1. Total pre-deployment and post-deployment health assessments, by month and year, U.S. Armed Forces, January 2003-June 2006

	Pre-deployment		Post-deployment	
	No.	%	No.	%
Total	**1,339,803**	**100.0**	**1,342,642**	**100.0**
2003				
January	69,390	5.2	6,221	0.5
February	110,571	8.3	5,077	0.4
March	69,855	5.2	6,755	0.5
April	37,599	2.8	19,350	1.4
May	12,885	1.0	92,882	6.9
June	14,416	1.1	65,381	4.9
July	18,062	1.3	52,902	3.9
August	16,513	1.2	35,154	2.6
September	12,799	1.0	32,446	2.4
October	24,169	1.8	27,047	2.0
November	19,701	1.5	21,542	1.6
December	36,156	2.7	22,242	1.7
2004				
January	70,206	5.2	39,999	3.0
February	39,203	2.9	32,284	2.4
March	22,842	1.7	66,654	5.0
April	19,944	1.5	44,505	3.3
May	27,797	2.1	17,910	1.3
June	24,666	1.8	28,404	2.1
July	22,805	1.7	24,342	1.8
August	34,300	2.6	23,011	1.7
September	32,205	2.4	24,394	1.8
October	35,651	2.7	15,864	1.2
November	36,235	2.7	22,080	1.6
December	38,607	2.9	27,067	2.0
2005				
January	34,682	2.6	56,088	4.2
February	24,762	1.8	70,004	5.2
March	20,879	1.6	53,507	4.0
April	26,983	2.0	19,113	1.4
May	18,769	1.4	21,078	1.6
June	25,582	1.9	19,282	1.4
July	21,621	1.6	17,291	1.3
August	47,298	3.5	29,676	2.2
September	34,496	2.6	38,988	2.9
October	37,196	2.8	37,440	2.8
November	35,198	2.6	38,734	2.9
December	21,232	1.6	56,723	4.2
2006				
January	29,815	2.2	37,869	2.8
February	22,173	1.7	18,824	1.4
March	20,647	1.5	20,394	1.5
April	18,504	1.4	17,746	1.3
May	23,799	1.8	21,905	1.6
June	29,590	2.2	14,467	1.1

were indicated (Table 2); and 88% and 86% of all active and Reserve component respondents, respectively, had hospitalizations and/or medical encounters within 6 months after documented post-deployment referrals (Table2).

During interviews by health care providers, approximately 16% of respondents expressed concerns about possible exposures or events during the deployment that they felt may affect their health ("exposure concerns") (Table 3). The proportion of respondents who reported exposure concerns significantly varied from month to month. In general, in the active components, rates of exposure concerns increased through calendar year 2003 and have been relatively stable (5-15%) since the spring of 2004 (Figure 4). In the Reserve components, rates of exposure concerns increased through the spring of 2004 and have been relatively high (15-30%) since then (Figure 4). Reports of exposure concerns have been generally higher in the Army than the other services and in the Reserve compared to the active component (Table 3). Finally, prevalences of exposure concerns increase with age among members of both active and Reserve components (Tables 3, 4).

Figure 1. Percent distributions of self-assessed health status, pre- and post-deployment, U.S. Armed Forces, January 2003-June 2006.



Editorial comment: Since January 2003, approximately 75% of U.S. servicemembers have assessed their overall health as “very good” or “excellent” when they are mobilized and/or prior to deploying overseas; and approximately 60% have assessed their overall health as “very good” or “excellent” at the end of their deployments. Most of the changes in assessments of overall health from pre- to post-deployment have been relatively minor (i.e., one category on a 5-category scale). Still, however, approximately one of nine post-deployers have indicated relatively significant declines (i.e., two or more categories) in their overall health from pre- to post-deployment. The findings are attributable at least in part to the extreme physical and psychological stresses associated with mobilization, overseas deployment, and harsh and dangerous living and working conditions.[15-17]

The deployment health assessment process is specifically designed to identify, assess, and follow-up as necessary all servicemembers with concerns regarding their health and/or deployment-related exposures. Overall, for example, approximately one-fourth of all returning soldiers had “referral indications” documented on post-deployment health assessments; and of those, most had documented outpatient visits and/or hospitalizations within 6 months after they returned.

Of interest, “exposure concerns” among post-deploying respondents significantly vary from month to month. Since the beginning of 2004, exposure concerns have been much more common among Reserve compared to active component members. Among both active and Reserve component members, exposure concerns significantly increase with age, and in both components, servicemembers older than 40 are approximately twice as likely as those younger than 20 to report exposure concerns.

References

1. Medical readiness division, J-4, JCS. Capstone document: force health protection. Washington, DC. Available at: < http://www.dtic.mil/jcs/j4/organization/hssd/fhpcapstone.pdf >.
2. Brundage JF. Military preventive medicine and medical surveillance in the post-cold war era. *Mil Med.* 1998 May;163(5):272-7.
3. Trump DH, Mazzuchi JF, Riddle J, Hyams KC, Balough B. Force health protection: 10 years of lessons learned by the Department of Defense. *Mil Med.* 2002 Mar;167(3):179-85.
4. Hyams KC, Riddle J, Trump DH, Wallace MR. Protecting the health of United States military forces in Afghanistan: applying lessons learned since the Gulf War. *Clin Infect Dis.* 2002 Jun 15;34(Suppl 5):S208-14.
5. DoD instruction 6490.3, subject: Implementation and application of joint medical surveillance for deployments. 7 Aug 1997.
6. 10 USC 1074f, subject: Medical tracking system for members deployed overseas. 18 Nov 1997.
7. ASD (Health Affairs) memorandum, subject: Policy for pre- and post-deployment health assessments and blood samples (HA policy: 99-002). 6 Oct 1998.
8. ASD (Health Affairs) memorandum, subject: Updated policy for pre- and post-deployment health assessments and blood samples (HA policy: 01-017). 25 Oct 2001.
9. JCS memorandum, subject: Updated procedures for deployment health surveillance and readiness (MCM-0006-02). 1 Feb 2002.
10. USD (Personnel and Readiness) memorandum, subject: Enhanced post-deployment health assessments. 22 Apr 2003.
11. Rubertone MV, Brundage JF. The Defense Medical Surveillance System and the Department of Defense Serum Repository: glimpses of the future of comprehensive public health surveillance. *Am J Pub Hlth.* 2002 Dec;92(12):1900-4.
12. Brundage JF, Kohlhase KF, Gambel JM. Hospitalization experiences of U.S. servicemembers before, during, and after participation in peacekeeping operations in Bosnia-Herzegovina. *Am J Ind Med.* 2002 Apr;41(4):279-84.
13. Brundage JF, Kohlhase KF, Rubertone MV. Hospitalizations for all causes of U.S. military service members in relation to participation in Operations Joint Endeavor and Joint Guard, Bosnia-Herzegovina, January 1995 to December 1997. *Mil Med.* 2000 Jul;165(7):505-11.
14. Trump DH. Self-rated health and health care utilization after military deployments. *Mil Med.* 2006 Jul;171(7):662-8.
15. Hyams KC, Wignall FS, Roswell R. War syndromes and their evaluation: from the U.S. Civil War to the Persian Gulf War. *Ann Intern Med.* 1996 Sep 1;125(5):398-405.
16. Hoge CW, Castro CA, Messer SC, McGurk D, Cotting DI, Koffman RL. Combat duty in Iraq and Afghanistan, mental health problems, and barriers to care. *N Engl J Med.* 2004 Jul 1;351(1):13-22.
17. Hoge CW, Auchterlonie JL, Milliken CS. Mental health problems, use of mental health services, and attrition from military service after returning from deployment to Iraq or Afghanistan. *JAMA.* 2006 Mar 1;295(9):1023-32.

Figure 2. Self-assessed health status on post-deployment form, in relation to self-assessed health status on pre-deployment in the same individual, U.S. Armed Forces, January 2003-June 2006.

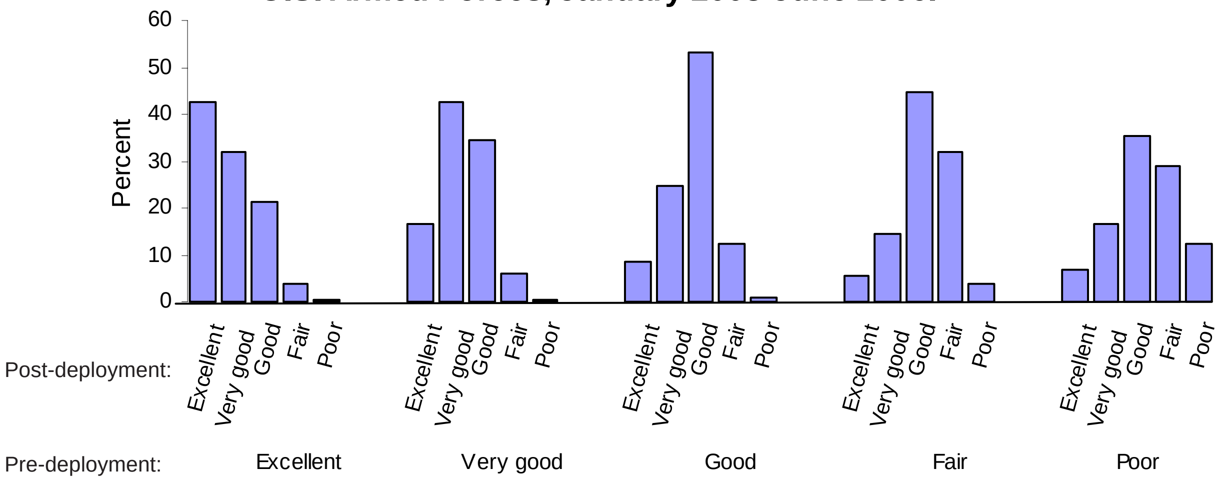


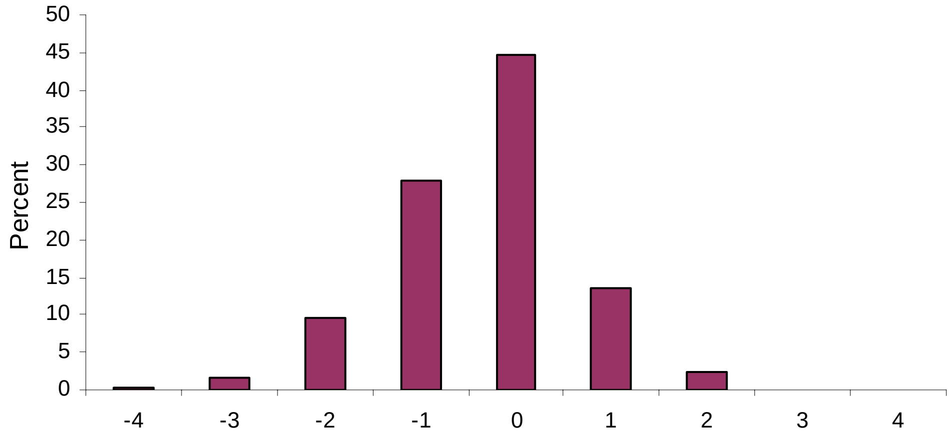
Table 2. Responses to selected questions from post-deployment forms (DD2796) by service and component, U.S. Armed Forces, January 2003-June 2006

	Army	Navy	Air Force	Marines	Total
Active component					
SMs with DD 2796 in DMSS	**290,942**	**102,106**	**121,975**	**89,635**	**604,658**
Electronic version	79%	7%	72%	14%	56%
General health ("fair" or "poor")	9%	5%	2%	6%	6%
Medical/dental problems during deploy	30%	12%	12%	20%	22%
Currently on profile	11%	2%	2%	3%	6%
Mental health concerns	7%	3%	1%	2%	4%
Exposure concerns	17%	5%	4%	11%	12%
Health concerns	13%	6%	5%	9%	10%
Referral indicated	27%	7%	10%	13%	18%
Med. visit following referral[1]	93%	72%	90%	65%	88%
Post deployment serum[2]	90%	82%	88%	88%	88%
Reserve component					
SMs with DD 2796 in DMSS	**276,020**	**16,531**	**44,794**	**19,773**	**357,118**
Electronic version	72%	15%	62%	17%	65%
General health ("fair" or "poor")	11%	6%	2%	8%	10%
Medical/dental problems during deploy	45%	36%	15%	35%	40%
Currently on profile	14%	4%	2%	3%	12%
Mental health concerns	7%	3%	1%	3%	6%
Exposure concerns	25%	20%	8%	25%	23%
Health concerns	22%	21%	11%	22%	21%
Referral indicated	27%	19%	11%	23%	24%
Med. visit following referral[1]	90%	79%	58%	55%	86%
Post deployment serum[2]	94%	91%	70%	89%	90%

[1] Inpatient or outpatient visit within 6 months after referral.

[2] Only calculated for DD 2796 completed since 1 June 2003.

Figure 3. Distribution of changes in self-assessed health status as reported on pre- and post-deployment forms, U.S. Armed Forces, January 2003-June 2006.



Change in self-assessment of overall health status, pre- to post-deployment, calculated as: post deployment response - pre-deployment response, using the following scale for health status: 1="poor"; 2="fair"; 3="good"; 4="very good"; and 5="excellent".

Table 3. Reports of exposure concerns on post-deployment health assessments, U.S. Armed Forces, January 2003-June 2006

	Total[1]	Exposure concerns	% with exposure concerns
Total	**947,110**	**149,844**	**15.8**
Component			
Active	594,735	68,413	11.5
Reserve	352,375	81,431	23.1
Service			
Army	556,321	118,776	21.4
Navy	116,980	7,968	6.8
Air Force	165,359	8,742	5.3
Marine Corps	108,450	14,358	13.2
Age (years)			
<20	24,318	1,939	8.0
20-29	502,500	65,825	13.1
30-39	261,837	46,119	17.6
>39	158,443	35,961	22.7
Gender			
Men	840,640	131,338	15.6
Women	106,469	18,506	17.4
Race/ethnicity			
Black non-Hispanic	163,085	27,963	17.1
Hispanic	93,344	16,051	17.2
Other	2,336	243	10.4
White non-Hispanic	621,732	95,029	15.3
Grade			
Enlisted	824,746	129,128	15.7
Officer	122,355	20,716	16.9

[1]Totals do not include non-responses/missing data.

Figure 4. Proportion of post-deployment forms that include reports of exposure concerns, by month, U.S. Armed Forces, January 2003-June 2006.

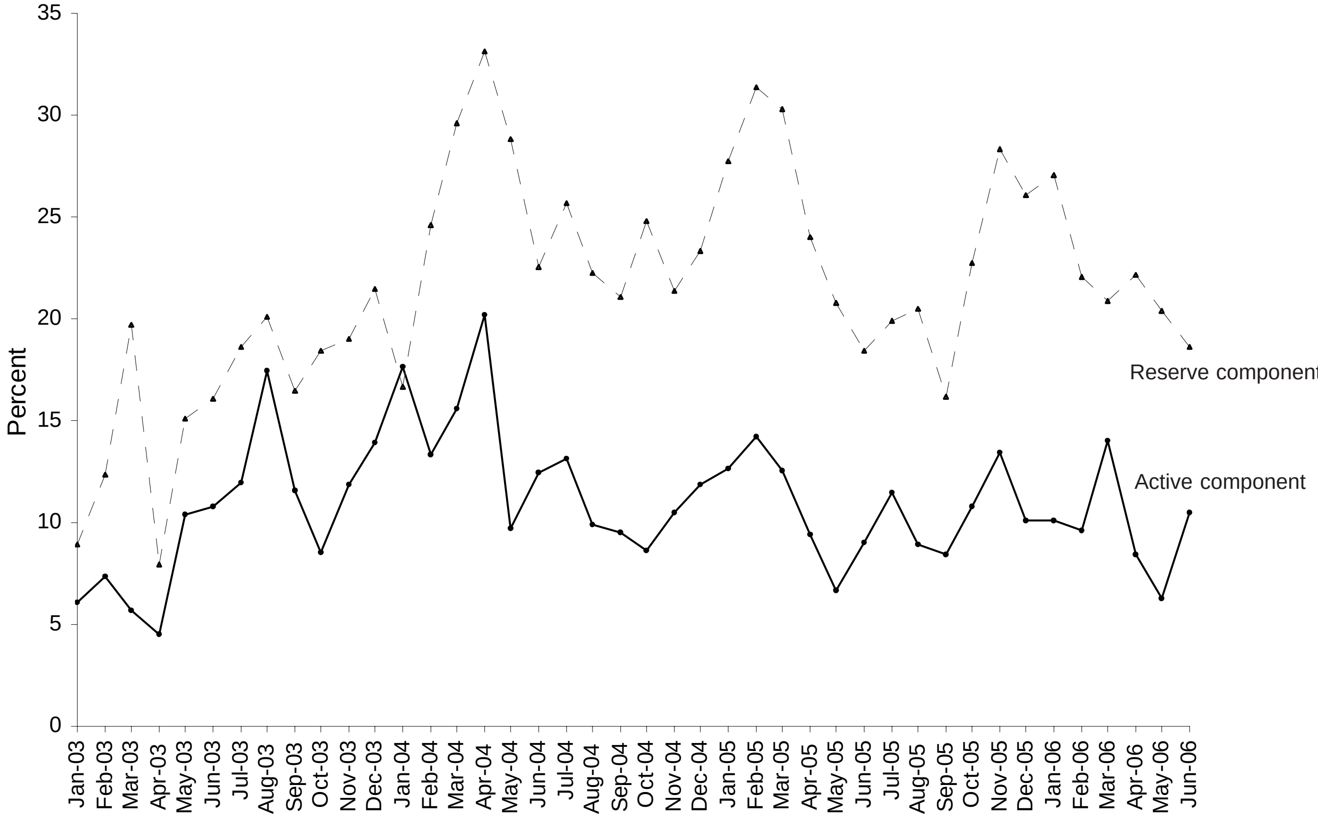
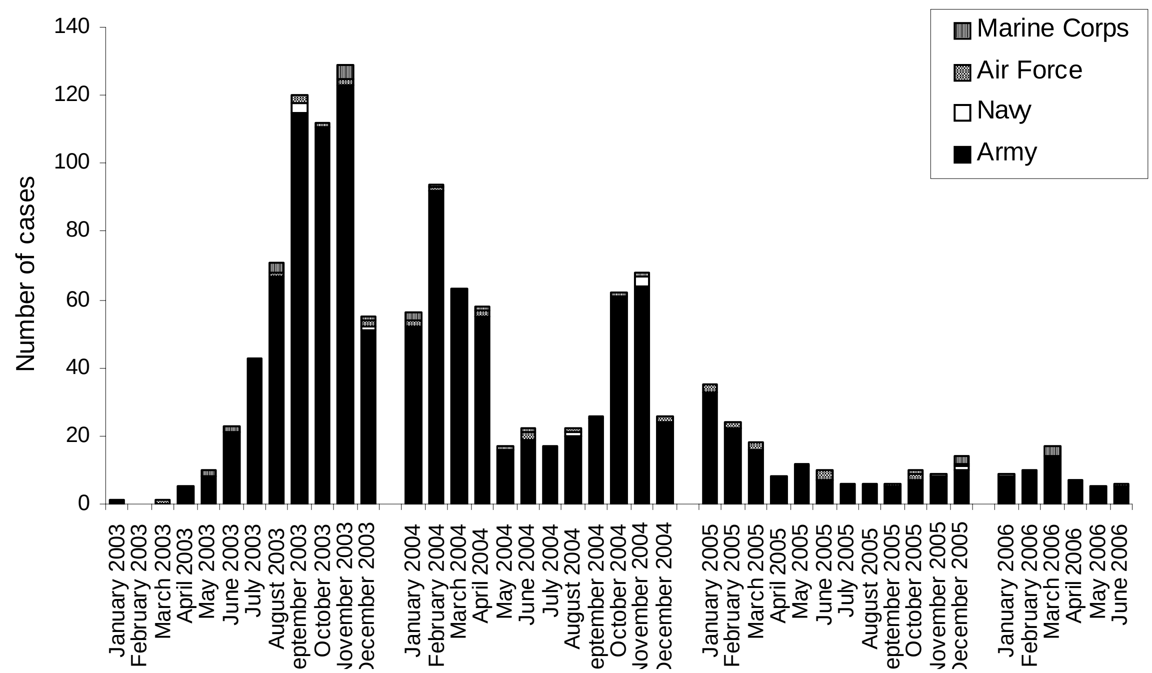


Table 4. Proportion of post-deployment forms that include reports of exposure concerns, by age group and component, U.S. Armed Forces, January 2003-June 2006

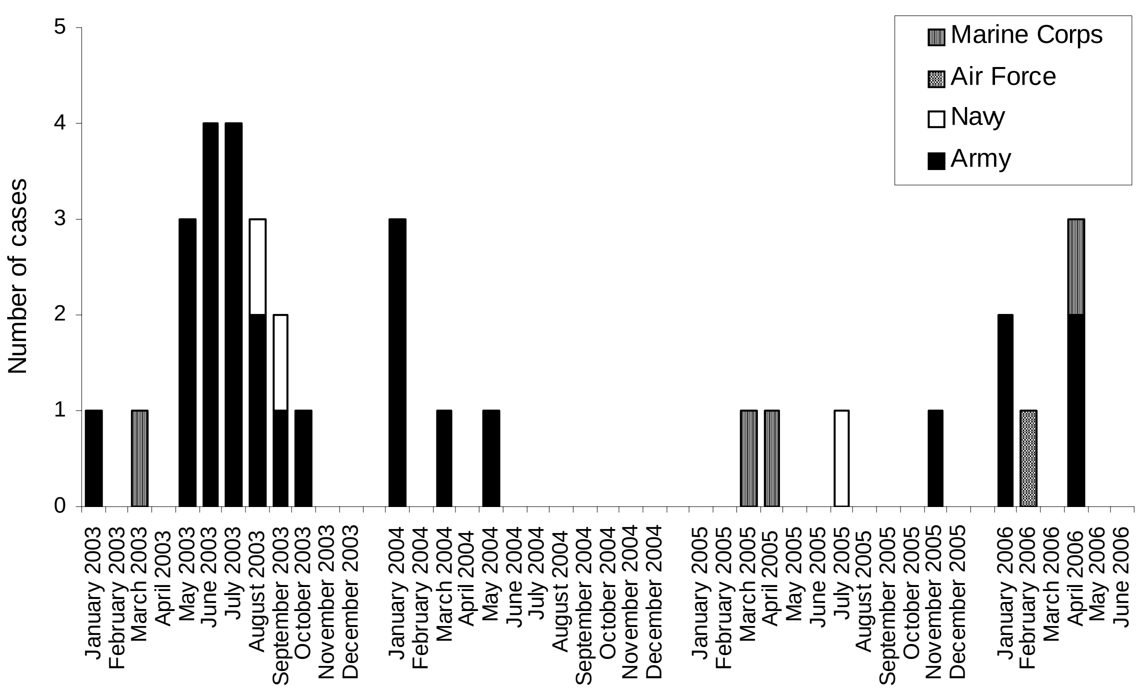
Age group	Active	Reserve
<20	6.4	13.9
20-29	10.5	20.4
30-39	13.2	24.0
>39	15.9	26.1

Deployment related conditions of special surveillance interest, U.S. Armed Forces, by month and service, January 2003-June 2006

Leishmaniasis (ICD-9-CM: 085.0-85.5)[1]



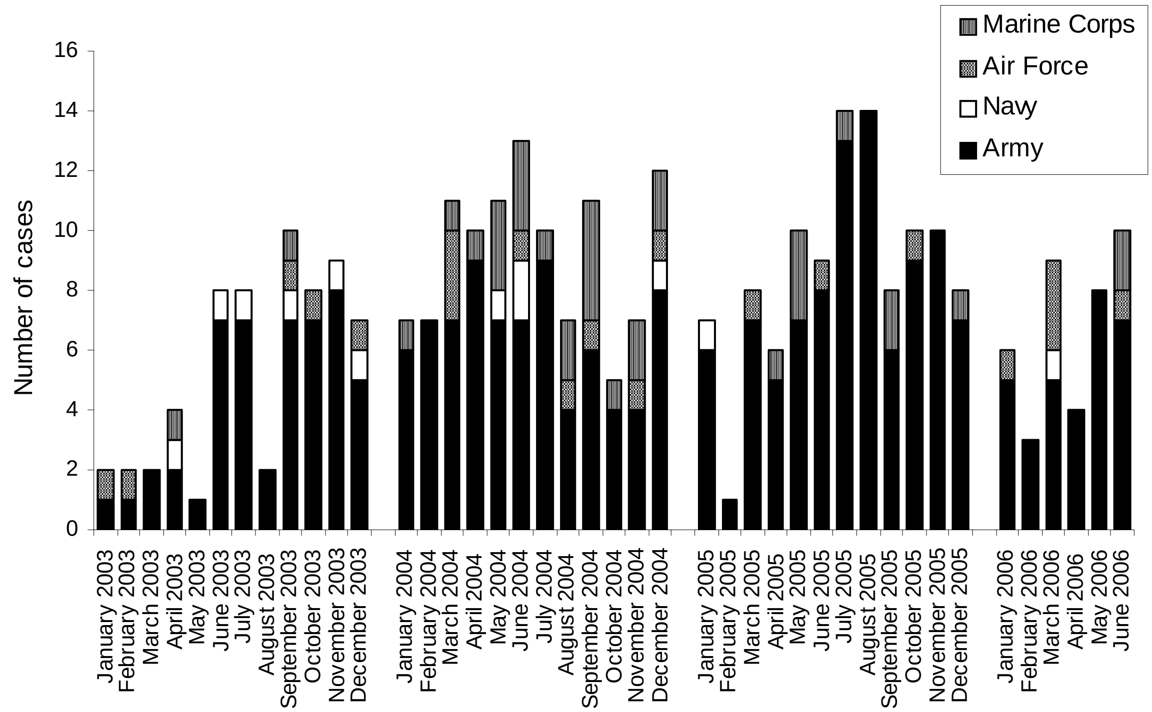
Acute respiratory failure/ARDS (ICD-9-CM:518.81, 518.82)[2]



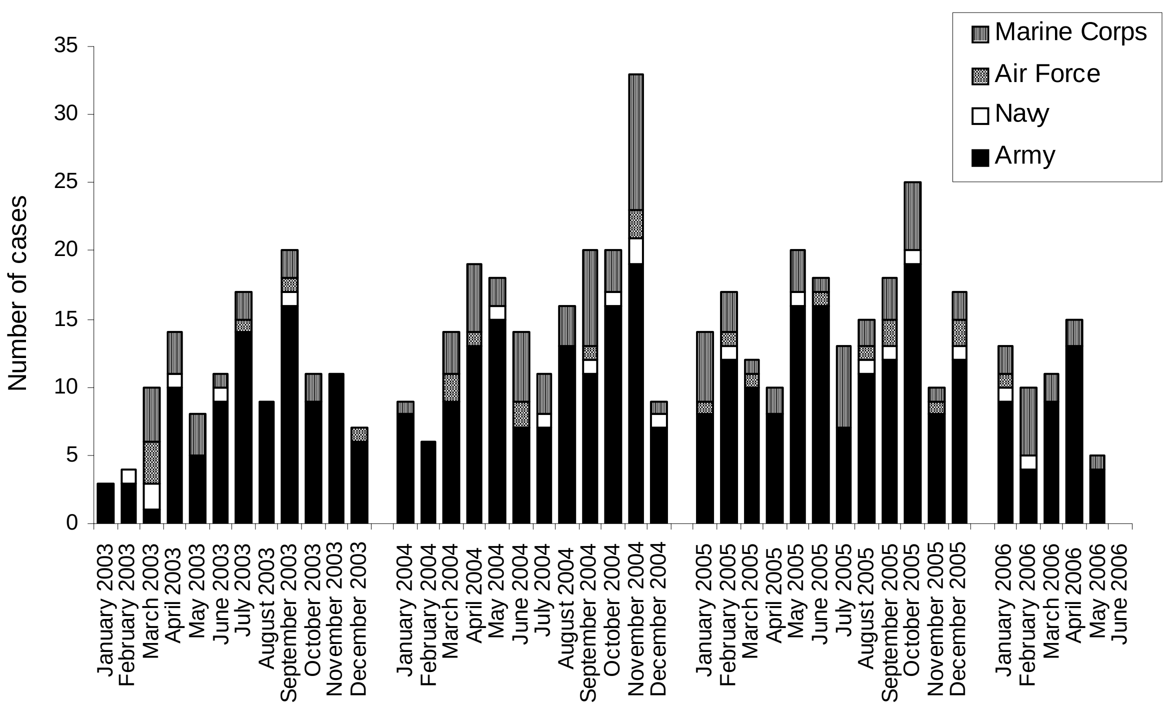
Footnotes:
[1] Indicator diagnosis (one per individual) during a hospitalization, ambulatory vist, and/or from a notifiable medical event during/after service in OEF/OIF.
[2] indicator diagnosis (one per individual) during a hospitalization while deployed to/within 30 days of returning from OEF/OIF.

(Con't.) Deployment related conditions of special surveillance interest, U.S. Armed Forces, by month and service, January 2003-June 2006

Deep vein phlebitis/thromboembophlebitis and/or pulmonary embolism/infarction (ICD-9-CM: 541.1, 451.81, 415.1)[3]



Amputations (ICD-9-CM: 84.0, 84.1, 887, 896, V49.6, V49.7)[4]



Footnotes:
[3] Indicator diagnosis (one per individual) during a hospitalization or ambulatory visit while deployed to/within 30 days of returning from OEF/OIF.
[4] Indicator diagnosis (one per individual) during a hospitalization of a servicemember during/after service in OEF/OIF.

Sentinel reportable events for all beneficiaries[1] at U.S. Army medical facilities, cumulative numbers[2] for calendar years through June 30, 2005 and 2006

Reporting location	Number of reports all events[3]		Food-borne								Vaccine Preventable					
			Campylo-bacter		Giardia		Salmonella		Shigella		Hepatitis A		Hepatitis B		Varicella	
	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006
NORTH ATLANTIC																
Washington, DC Area	274	149	2	4	4	1	2	2	2	.	.	.	2	1	1	.
Aberdeen, MD	57	12	.	.	.	.	.	.	1	.	.	.	.	.	.	.
FT Belvoir, VA	229	197	6	6	.	.	3	4	.	1	.	.	.	.	.	.
FT Bragg, NC	895	868	5	5	.	.	6	6	2	.	.	.	.	.	.	.
FT Drum, NY	126	122	.	.	.	.	.	.	.	.	.	.	.	.	.	.
FT Eustis, VA	165	113	.	.	.	.	1	.	.	.	.	.	.	.	.	.
FT Knox, KY	149	135	1	.	.	.	2	.	.	.	.	.	.	.	.	.
FT Lee, VA	99	206	.	.	.	.	.	.	.	.	.	.	.	.	.	.
FT Meade, MD	62	66	.	.	.	.	1	.	.	.	.	.	.	.	1	.
West Point, NY	26	26	.	.	.	.	.	1	.	.	.	.	.	1	.	.
GREAT PLAINS																
FT Sam Houston, TX	265	230	.	.	.	.	2	.	1	.	.	1	3	1	.	.
FT Bliss, TX	252	316	1	.	4	2	2	3	4	1	.	3	.	.	.	1
FT Carson, CO	442	469	3	.	2	.	1	3	.	.	.	1	.	.	.	.
FT Hood, TX	1,278	943	3	2	.	1	1	5	3	5	.	.	.	.	.	1
FT Huachuca, AZ	40	27	.	.	.	.	.	.	.	.	.	.	.	.	.	.
FT Leavenworth, KS	17	20	.	.	.	.	1	.	.	.	.	.	.	.	.	.
FT Leonard Wood, MO	201	153	1	.	.	2	1	1	.	.	.	.	.	.	2	6
FT Polk, LA	123	117	.	2	1	1	1	.	.	.	.	2	1	.	.	.
FT Riley, KS	143	190	.	2	1	.	.	.	.	.	.	.	.	.	.	.
FT Sill, OK	95	126	.	.	.	.	.	1	1	.	.	.	.	.	.	1
SOUTHEAST																
FT Gordon, GA	221	254	.	.	.	.	.	.	.	.	.	.	4	9	.	.
FT Benning, GA	153	246	1	2	1	1	3	2	2	.	.	.	.	.	.	.
FT Campbell, KY	597	336	.	.	.	.	3	.	4	.	.	.	.	.	1	.
FT Jackson, SC	88	138	.	.	.	.	.	.	.	.	2	.	.	.	.	.
FT Rucker, AL	19	36	.	1	.	.	.	.	.	.	.	.	.	.	.	.
FT Stewart, GA	296	381	.	.	.	.	5	1	.	3	6	2	24	4	.	3
WESTERN																
FT Lewis, WA	335	333	3	.	.	.	1	1	.	.	.	.	.	.	.	1
FT Irwin, CA	37	56	.	.	.	.	.	.	.	.	.	.	.	.	.	.
FT Wainwright, AK	92	107	2	.	.	.	.	1	.	.	.	.	.	.	.	.
OTHER LOCATIONS																
Hawaii	419	528	20	17	4	1	5	9	.	.	.	.	.	.	.	.
Europe	959	497	13	10	.	.	9	10	1	.	3	1	4	1	2	1
Korea	258	268	.	.	.	.	.	.	.	.	1	.	1	3	.	4
Total	**8,412**	**7,665**	**61**	**51**	**17**	**9**	**50**	**50**	**21**	**10**	**12**	**10**	**39**	**20**	**7**	**18**

[1] Includes active duty servicemembers, dependents, and retirees.

[2] Events reported by July 7, 2005 and 2006.

[3] Seventy events specified by Tri-Service Reportable Events, Version 1.0, July 2000.

Note: Completeness and timeliness of reporting vary by facility.

Source: Army Reportable Medical Events System.

(Cont'd) Sentinel reportable events for all beneficiaries[1] at U.S. Army medical facilities, cumulative numbers[2] for calendar years through June 30, 2005 and 2006

Reporting location	Arthropod-borne				Sexually Transmitted								Environmental			
	Lyme disease		Malaria		Chlamydia		Gonorrhea		Syphilis[4]		Urethritis[5]		Cold		Heat	
	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006
NORTH ATLANTIC																
Washington, DC Area	1	.	2	2	97	76	16	12	7	2	.	1	1	.	2	.
Aberdeen, MD	1	.	.	.	19	9	3	1	2	.	.	.	.	.	.	.
FT Belvoir, VA	1	.	.	.	109	98	30	22	.	.	.	.	.	.	.	.
FT Bragg, NC	.	.	.	9	635	621	132	87	2	3	62	77	1	1	33	53
FT Drum, NY	.	.	.	.	73	108	4	14	.	.	.	.	2	.	1	.
FT Eustis, VA	.	.	.	.	92	80	22	22	.	.	.	.	2	.	2	2
FT Knox, KY	1	5	.	.	88	95	10	19	.	.	.	.	1	3	11	4
FT Lee, VA	1	.	.	.	83	153	13	26	.	.	.	.	1	.	1	.
FT Meade, MD	.	.	.	.	55	58	5	7	.	.	.	1	.	.	.	.
West Point, NY	3	2	.	.	16	15	1	.	.	.	.	.	1	1	.	.
GREAT PLAINS																
FT Sam Houston, TX	.	.	.	.	156	169	45	48	3	3	.	.	.	.	11	1
FT Bliss, TX	.	.	1	1	100	164	13	29	2	2	.	.	.	.	6	.
FT Carson, CO	.	.	3	.	283	303	34	62	.	.	15	25	1	.	.	.
FT Hood, TX	.	.	1	.	745	585	259	151	.	.	143	19	.	.	50	19
FT Huachuca, AZ	.	.	.	.	27	24	11	2	.	.	.	.	.	1	1	.
FT Leavenworth, KS	.	.	.	.	14	18	1	2	.	.	.	.	1	.	.	.
FT Leonard Wood, MO	.	.	.	.	110	102	26	9	1	.	1	.	4	.	5	4
FT Polk, LA	.	.	.	.	86	70	26	22	1	1	.	.	.	.	2	19
FT Riley, KS	.	1	.	.	75	162	28	16	.	.	.	.	5	.	1	.
FT Sill, OK	.	.	.	.	37	37	18	13	.	2	.	.	.	.	15	16
SOUTHEAST																
FT Gordon, GA	.	.	1	.	137	176	10	35	1	.	.	3	.	.	24	2
FT Benning, GA	.	.	1	.	94	158	26	39	.	.	.	.	1	.	22	39
FT Campbell, KY	2	.	1	.	414	228	77	37	.	.	.	.	1	.	21	9
FT Jackson, SC	.	.	.	.	70	125	12	13	.	.	.	.	.	.	.	.
FT Rucker, AL	.	.	.	.	11	30	8	3	.	.	.	.	.	.	.	1
FT Stewart, GA	1	3	.	2	147	243	64	80	.	1	9	10	1	1	11	13
WESTERN																
FT Lewis, WA	.	.	3	2	237	260	33	38	.	.	41	22	.	.	.	.
FT Irwin, CA	.	.	.	.	26	43	7	8	.	2	.	.	.	.	4	3
FT Wainwright, AK	.	.	1	11	62	61	8	9	1	.	.	.	14	16	.	.
OTHER LOCATIONS																
Hawaii	.	.	7	2	271	396	32	46	.	.	.	.	.	.	2	2
Europe	15	8	2	7	604	317	160	102	2	1	1	1	5	.	.	.
Korea	.	.	.	5	212	196	35	46	2	2	.	.	3	2	1	2
Total	**26**	**19**	**23**	**41**	**5,185**	**5,180**	**1,169**	**1,020**	**24**	**19**	**272**	**159**	**45**	**25**	**226**	**189**

[4] Primary and secondary.

[5] Urethritis, non-gonococcal (NGU).

Note: Completeness and timeliness of reporting vary by facility.

Source: Army Reportable Medical Events System.

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